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HAWAII COUNTY IN 1980

A Report by the Research Division *September, 1980*

In 1980 the general slump in tourism has hit Hawaii County hardest of all the islands, but even so the Big Island is displaying an overall stability which is the result of a diversified economic base built up over the last decade.

Big Island tourism was hurt last year by the two-month strike against United Airlines, which interrupted United's growing promotion of the Hilo gateway. Then double-digit inflation (which reduced consumers' disposable income), rising air fares, and the national economic downturn caused a general decline in travel in late 1979 and early 1980. The slump appears to have bottomed out in the first quarter, but visitors to the Big Island are trailing last year's numbers by a significant margin. Discount air fares on overseas flights have aided the state's overall visitor business, but interisland fares continue to go up, and of course the fares from Honolulu to Hilo or Kona are the highest of all. Hopes for the Hilo gateway (which opened in 1967 and was expected to encourage visitors to come direct to the Big Island from the Mainland) have pretty well collapsed. Of the eight transpacific airlines that were authorized to serve Hilo, only United Airlines is still providing service, which it reduced in September to Los Angeles-Hilo flights only. Many people on the Big Island feel that Kona would be a more convenient and popular gateway for visitor arrivals; however, the Ke-ahole Airport runways will have to be lengthened in order to handle overseas jets. Papaya and flower growers depend heavily on cargo space available on the direct passenger flights, so Big Islanders are hoping that Mainland-Hilo visitor traffic will be adequate to keep United from pulling out entirely.

Aside from these areas of concern, Hawaii County's economy is holding up well, bolstered by a strong sugar industry, continued gains in diversified agriculture, a relatively good construction volume, and continuing research and development in alternate energy. The sturdiness of the economy is verified by average monthly employment for the first seven months, which is up 2.6 percent to 33,050, and the average 6.4 percent rate of unemployment for this period, which is the lowest in nine years for Hawaii County. Employment in the service industries was up substantially, with even hotel employment up 8.3 percent. Employment in retail establishments and in State and County government also increased. Average monthly employment in construction was 3 percent higher in the first seven months than it was in 1979. The value of public contracts awarded was down 24.1 percent through July, but the value of private building permits was up 53.7 percent, largely due to the start of construction of the Sheraton Royal Waikoloa Hotel early this year. Tax collections were up 10 percent in the first seven months, bank deposits were up 16.6 percent, and the dollar value of checks written was up 20 percent.

Looking back over the decade just past, growth in Hawaii County has been more rapid than had been projected. The preliminary 1980 Census results show a population of 92,206 for the county, an increase of 28,738 or 45.3 percent over the 1970 Census. (Official State forecasts had expected Hawaii County's population to grow to 84,700 by 1980.) The Big Island's hotel inventory rose from 3,166 units in 1970 to 6,260 in 1980, while visitor arrivals increased from 445,400 in 1970 to 860,900 in 1979. Visitor expenditures increased from $53.4 million in 1970 to $172.2 million in 1979. In construction, the value of private permits and public contracts awarded amounted to $65 million in 1970, and reached $159.5 million in 1979, culminating a busy decade of building. Although sugar revenues fluctuated widely during the decade, Big Island sugar plantations saw returns climb from $69.6 million in 1970 to $117.9 million in 1979, with a new record likely for 1980. The farm value of diversified crops and livestock climbed from $24.6 million in 1970 to $67.4 million in 1979.

ALTERNATE ENERGY DEVELOPMENT

Identification of the state's alternate energy resources and serious research on how to develop them began only in the last decade. Hawaii has come a long way in a short time, thanks in part to federal research funding. As the decade of the 1980s begins, Hawaii's next step is to develop some of these resources. The passage of the Energy Security Act of 1980 assures more federal funds for feasibility studies and demonstration projects, but leaves actual development of alternate energy sources largely up to the private sector, which has made no significant effort yet (except in applying for federal grants). The new legislation offers liberal subsidies to homeowners for home solar installations, but provides only price supports, loans, or loan guarantee programs for development of geothermal, biomass, hydropower, and other alternate energy sources. Immense amounts of capital, lots of faith, and vigorous action by private industry will be needed to reduce the nation's dependence on oil. Private investment for development of alternate energy sources is just beginning to flow into Hawaii County, following research efforts of the last few years.

Because of the rich alternative energy resources on the Big Island, the State and the University of Hawaii have concentrated their energy research efforts largely on this island. Research in geothermal energy got its start in 1972 when the Legislature appropriated $200,000 to locate and study the potential fields and how they might be developed. Ocean thermal energy conversion (OTEC) research got a big push two years later. Biomass-fueled energy—burning sugar cane waste to generate power for the sugar mills—has always been important to Hawaii's economy, but the sugar plantations only had to supply their own needs, and efficiency was not important, economically speaking, because there was no profitable market for excess power. These alternative sources of energy suddenly

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became important in the last decade when the international oil cartel, OPEC (Organization of Petroleum Exporting Countries), began to escalate prices so rapidly that energy costs soared. Consequently, development of non-fossil fuel sources is becoming more economically feasible.

Hawaii had a head start in developing energy from biomass because the sugar industry already had considerable expertise in using bagasse for fuel. In Hawaii County the plantations have invested in improved boilers, better bagasse-drying systems, and new generating plants to reduce their own fuel oil consumption and to provide more power to the Hawaii Electric Light Co., which now buys about 35 percent of its power from the sugar plantations.

The State, University of Hawaii, and Hawaii County drilled the first geothermal well in Puna down to a depth of 6,450 feet in 1976, and hit very high temperature steam. With a grant from the U.S. Department of Energy, a three-megawatt generating unit is being constructed, scheduled for completion next spring. The plant will be tested for two years, with the power to be fed into the Hawaii Electric Light Co. grid. Now more wells are going to be drilled to prove out the Kapoho Geothermal Reservoir. Gedco is going to drill up to six wells for its parent firm, Barnwell Industries, a Tennessee-based firm, with the first one nearing completion. Gedco's application to drill up to nine wells in another location for yet another company was going through public hearings in August, and public reaction was relatively favorable for that project. Gedco has applied to the County for yet a third project of up to 16 wells in the same rift zone for a third company. Public hearings on this are yet to begin.

This interest and investment in the Puna field is most encouraging. The cost of drilling a well is estimated at $1 million to $1.5 million, and many many holes will have to be drilled (perhaps 200 since some will be dry) in order to produce an amount of power on the order of 600 megawatts. But it will not be easy to attract enough private capital to develop this immense power resource when there is so little market for power on the Big Island, which is only an 86-megawatt community. Within ten years a deepsea transmission cable to Oahu (to take the power where the market is) will probably be technologically feasible, but it's not likely that anyone will invest in laying a $100-million cable unless the wells are drilled and reliable quantities of power are developed.

A federally funded study last year by Amfac Inc. on using geothermal steam directly showed that steam pumped to its Puna Sugar Co. factory could save millions of dollars in oil purchases, and could generate electric power at costs that would save consumers money. However, the construction of a 16-mile energy corridor to carry the steam is economically unfeasible for Amfac, so the study suggested that the State build it. Dillingham Corp. is about to release a year-long study on the economic feasibility of a geothermal industrial park in Puna next to the geothermal fields. Proposed activities include the production of ethanol from bagasse, wood, and other plant material, recovery of protein from giant koa haole, and drying of fruits.

Mini-OTEC, which proved to the world for the first time in August 1979 that the technology of ocean thermal energy conversion is feasible, was to be deployed again this year off Kona to gather more data. A shortage of federal funds has delayed this project. However, OTEC 1 aboard the SS Ocean Energy Converter went on station off Keahole Point this past summer for three years of data gathering. The one-megawatt heat exchangers will be tested, but no power is to be generated.

The Seacoast Test Facility at Keahole Point is now under construction, with work proceeding on the laboratories and test pads. Biofouling and corrosion of heat exchangers will be studied, and research will be conducted on closed and open-cycle OTEC systems.

C. Brewer & Co.'s forestry project is proceeding very well. A hundred acres of eucalyptus trees have been planted, with 800 more acres to be planted at 200 acres a year. The trees were expected to grow a foot a month but so far have averaged a foot and a half a month. The aim of the project is to study different varieties and cultural practices and eventually to test the fuel content of the wood chips in order to determine how to get the highest BTU per acre at the lowest cost.

In the first wind energy study on the Big Island, Rockwell International Inc., under contract with the Department of Energy, has installed a 40-kilowatt six-bladed Mehrkam windmill at Kahua Ranch. The winds of Kohala proved too strong for the equipment, and adjustments have had to be made in the blades of the windmill. The generator supplies most of the electrical needs of the ranch houses and buildings and feeds any excess power into the Hawaii Electric Light Co. grid. Data recorded on the minute-by-minute operation of the windmill and generator will be studied to provide information on the interconnection of small wind energy conversion systems to public utility systems.

TOURISM

The two-month airline strike and one-month grounding of the DC-10s last year affected the state's visitor industry adversely, but visitor arrivals for the entire year 1979 registered a respectable 7.9 percent gain to 3,960,531, thanks to a very heavy influx in the first quarter just before the strike. The market continues soft this year as the national recession has slowed down travel, affecting many destination areas including Hawaii. The first three months of 1980 were negative growth periods, but gains in the following four months raised the state's seven-month visitor arrival total to slightly more than in the first seven months of 1979.

The situation for the Big Island is quite different from that of the state as a whole. Historically, the Big Island has always suffered the most during tourist slowdowns. While the state experienced an increase in visitors in 1979, Hawaii County suffered its first decline since the Hawaii Visitors Bureau began keeping records by counties in 1962. It attracted only 860,940 visitors last year, down from 908,983 in 1978, a 5.3 percent decline. The situation has worsened this year, with arrivals down 9.6 percent through July. Considering economic conditions, the state is enjoying a good flow of visitors, but the problem is that fewer are going beyond Waikiki to visit the Neighbor Islands, least of all to the Big Island. The best occupancy attained by the Big Island so far this year is the 66.7 percent in February. Hotels were half empty in June with only 45.1 percent of rooms occupied, the lowest monthly rate ever recorded for the Big Island since the count began in 1964. The occupancy rate for Hilo hotels was below this average; hotels on the leeward sunset coast have traditionally enjoyed better traffic than the Hilo side. The lower occupancy this year is partly the result of a slightly increased inventory of rental units. There were 6,206 units in June 1980, an increase of 204 units over the 12-month period during which new units were opened at the Keauhou Surf and Racquet Club, Country Club Villas, and the Kona Village.

Although tourism is softest on the Big Island, more resort facilities are planned here than on the other islands in the next few years. Practically all of the developments planned are in West Hawaii, heavily concentrated in South Kohala but also in Keauhou-Kona and North Kohala.

Development of the South Kohala coast destination areas is most visible now at Waikoloa with the construction of the Sheraton Royal Waikoloa Hotel under way at Anaehoomalu Bay. At neighboring Mauna Lani Resort Inc. (formerly Mauna

Loa Land), work has started on the 18-hole championship golf course, and construction is expected to begin soon on the clubhouse and the first hotel. The Mauna Kea Beach Hotel, the northern anchor of this resort area, is going to add 117 rooms, a Japanese restaurant, eight more tennis courts, a swimming pool, a new parking lot, a service utility building, and improvements to the sewage treatment plant. Carrying out this plan is the Mauna Kea Land Corp., a wholly owned subsidiary of UAL Inc. Mauna Kea will develop the land that UAL acquired from Laurence Rockefeller which totals 4,000 acres owned in fee, leased, or held under development agreements.

The 548-room Sheraton Royal Waikoloa Hotel is being developed by TAAS Associates, a joint venture of Transcontinental Development Co., ATPAC Land Co., Aetna Casualty and Surety Co., and the Sheraton Corp. It will be operated by Sheraton Hawaii Management Corp., a subsidiary of the Sheraton Corp. The hotel is being built on 15.7 acres, and will have a swimming pool, six tennis courts, spacious luau and recreation areas, and an 18-hole championship golf course, which will open about the time the hotel is completed in the summer of 1982. The convention center will consist of a 600-seat ballroom, which can be divided into three sections for smaller meetings. There will be a main dining room, specialty restaurant, coffee shop, cocktail lounge and terrace, and gift shops. The hotel will consist of several structures from three to six stories in height plus beachfront lagoon suites. Charles Pankow Associates is the contractor, and the designer is the firm of Chapman, Cobeen, Desai, Sakata, Inc.

Mauna Lani Resort hopes to open its championship golf course and the clubhouse on July 1, 1981, when the transmission line from the Lalamilo wells is scheduled to be completed and water is available. It hopes to start work on its hotel this fall so that it can be opened in October 1982. The first phase will be a six-story complex with 353 rooms that can be expanded later to 465 rooms. The developer also wants to start construction of 80 luxury condominium units in two- and three-story detached structures next spring, so that they will be completed when the hotel is. A new road will be built from the highway to the hotel.

Mahukona Properties, a limited partnership with a substantial portion held by Finance Realty Co., is proposing to develop a high quality resort-residential complex on 1,045 acres of land two miles south of Mahukona harbor on the North Kohala coast. The development will be on four noncontiguous parcels running from makai to mauka and bisected by the Akoni Pule Highway, in effect creating eight noncontiguous parcels. The developer is considering leasing from the State the land between the parcels it owns. The proposal calls for the development of 1,500 hotel rooms, 3,465 medium-density condominium apartments, and 500 to 600 single-family houses. The plan is to develop this in four phases over 20 years. Included will be an 18-hole championship golf course, tennis and swimming facilities, and horseback riding and hiking trails. A change in zoning from agricultural to urban will be required, but the State lands if leased will be kept agricultural and will be used for environmental improvement and recreational purposes such as horseback riding and hiking. An environmental impact statement is being prepared, after which the plan will be submitted to the County Planning Department for an amendment to the General Plan.

Cambridge Properties, owner of the Kona Village, completed 14 cottages last year to bring its inventory to 95 units. Planning is continuing for a second village to the south, and condominium apartments to the north. An agricultural subdivision of 5,000 acres above the belt road is also in the planning stage.

Kamehameha Investment Corp., which asked the State Land Use Commission to change the zoning of 880 acres in Keauhou-Kona to urban, got approval for 600 acres. This will allow the expansion of the Keauhou-Kona resort community, the first phase of which is either developed or leased for development. Of the nine condominium-use parcels, seven have been developed or are in the process, and projects on the remaining two have received approvals and are ready for construction. A few hotel parcels remain to be developed.

AGRICULTURE

Hawaii County had agricultural receipts totaling $146.9 million in 1979, which was exactly one-third of the state total. However, its diversified agricultural receipts of $67.4 million were 43.9 percent of the state total. The big gain was in the area of diversified crops, which brought growers $43.9 million, an increase of 26.5 percent over 1978 receipts of $34.7 million. The biggest gain was in macadamia nuts which returned $16.7 million to growers in 1979, up 48.8 percent over 1978 receipts of $11.2 million. There were substantial gains in receipts for flowers and nursery products, coffee, fruits, and vegetables.

The production of vegetables and melons increased 2.3 percent and revenues jumped 17.9 percent to $6.6 million due to higher prices. Although the number of coffee farms and acreage harvested last year were lower, production increased to 1.8 million pounds due to higher yield, and receipts grew by 23.3 percent to $2.6 million due to higher prices. The average price for the year was $1.45 a pound compared with $1.26 a pound in 1978. Guava production is increasing on the Big Island, and the Hawaii Guava Growers Co-op Inc. was organized last year to coordinate culture and marketing. It has about 52 members who produced about 38 percent of the Big Island crop.

Cattle

Statewide production of cattle and calves which were sold for slaughter last year dropped to a four-year low of 54.6 million pounds, down 12.4 percent from 1978 sales of 62.3 million pounds. However, the average price for the year was about a third higher at 51.5 cents a pound (live weight), and receipts to ranches increased to $28.1 million, up from $24.4 million in 1978. The Big Island, which produced 60 percent of the 1979 slaughter, had a similar picture of lower production (32.8 million pounds) but record receipts ($17.2 million). Range cattle sold increased 2.5 percent to 14.1 million pounds, but a much higher average price resulted in a 53.5 percent increase in receipts to $6.7 million. On the other hand, cattle shipped to feedlots for fattening and slaughter was down 31.5 percent to 18.7 million pounds, but a substantially higher average price held receipts up at $10.5 million, a 9.6 percent decline. The liquidation phase of the cattle cycle combined with the drought of 1977-78 to reduce the number of calves produced resulted in last year's low production. Shipments to feedlots are down again this year, at least for the first half, and production may not begin to rise until 1981.

Hawaii Biogenics, the Kohala feedlot that was being run by a court-appointed trustee, was purchased with preliminary court approval by a partnership made up of Tom Mee of King City, California, and Jack Ramos of Honokaa. The partnership will be known as Hawaiian Edison Cattle Co., and the operation has been named Kohala Feedlot. Hawaii Biogenics owed the State $2.6 million, excluding interest, and other creditors another $1 million. In its bid, Hawaiian Edison pledged payments of 4 percent on the first million dollars in gross revenues, 3 percent on the second million, and 2 percent on anything above that, plus investment of $600,000 of new capital into the operation. By midsummer it had around 800 head in its feedlot. The animals came mainly from Oahu dairies and Big Island ranches. The firm estimates that it needs around 2,000 head in the feedlot to break even. The feedlot has the capacity for 4,000,

but could be expanded to handle 10,000. The new owners are not planting corn, but utilizing chopped grass with molasses added, and buying some feed to supplement it.

Sugar

1979 was the year that prices began to improve, and the Hawaiian sugar industry began to see light after three consecutive years of prices so depressed that revenue failed to cover cost. The average price received for sugar last year was $304 a ton compared with $262 a ton in 1978, while molasses brought a record $72.10 a ton, up from $50.60 in 1978. Statewide production of 1,059,737 tons of sugar and 326,000 tons of molasses by the industry returned revenues of $345.7 million, the third highest on record.

Sugar plantations on the Big Island produced 3 percent more sugar than in 1978. The 388,341 tons of sugar and 119,000 tons of molasses returned $126.4 million to the plantations, up from $107 million in 1978. Sugar prices are running much higher this year, and all plantations on the Big Island and in the rest of the state are expected to have near record revenues. However, production is expected to be down for the Big Island. The heavy rainstorms early this year delayed harvesting, and some of the plantations may not be able to complete their 1980 harvest. The rains also caused poor juice quality, resulting in lower sugar yield.

The plantations are continuing to improve their factories and operations with the objective of lowering cost. Most of this improvement is going on at Davies Hamakua Sugar Co. and the Hilo Coast Processing Co. Puna Sugar Co. has completed its improvements, and basically has a new mill and a new power plant whose capacity is rated at 17 megawatts. Now it needs more fuel to make use of that added capacity, and it is looking at wood, geothermal energy, and other sources to fill that need. Ka'u Sugar Co. is planning to install a new mill train after harvesting is completed next year. A 1975 earthquake caused the ground under the unreinforced foundation to settle, and the resultant stress has affected the mill train. The project will cost C. Brewer & Co. $2.8 million, but will increase the efficiency of this part of the factory, and will be ready for the 1982 harvest.

Davies Hamakua Sugar Co. is increasing the power generating capacities of its two mills at Haina and Ookala. A 7.5-megawatt generator is going on line at Haina, and combined with its 7.9-megawatt generator will give it a capacity of 15.4 megawatts. The Ookala mill will install a turbo-generator with a rated capacity of 4 megawatts to add to the present generator that has a 5-megawatt capacity. This will provide a combined capacity of 24.4 megawatts, of which the mills will need 7 megawatts for their operation, leaving 17.4 megawatts excess capacity for export. The two plants will be connected with a power line to integrate the generating units. A pelletizing plant is being built at Haina to increase the burning efficiency of bagasse and get more heat value from the same volume of fuel. Two dryers are also being installed, to tumble dry bagasse using flue gases from the smokestack. One will reduce the moisture content to 35 percent (normal is 48 percent), and the other will further reduce it to a lower level for pelletizing. The pelletizing unit will be tested next year to work the bugs out. In the field, Davies Hamakua has introduced its new S-75 short cane harvester. It will be evaluated this year in field trials. The company has programmed 9,000 of its 35,000 acres of sugarcane for drip irrigation, and conversion will be done over several years.

The Hilo Coast Processing Co. last year installed a system costing $500,000 to recover trash and short cane that was being lost in the milling process. The objective was to recover half of the trash, but recovery has averaged 75 percent. Another $240,000 has been appropriated to enlarge the system for full recovery of trash most of the time. In addition, the system has added 6 percent more cane to its crop by recovering short cane. The additional biomass fuel from the trash and short cane will help reduce the use of fuel oil down to 50,000 barrels from 200,000 in 1975. Mechanical dehydration has lowered the moisture content of bagasse, but the company is spending $2.1 million for a dryer using escaping heat from the smokestack, further reducing moisture and increasing the heat value of the drier bagasse. The improvements now in place will make power generation profitable for the first time for HCPC.

C. Brewer & Co. and HCPC received a grant of $900,000 from the Department of Energy in July to determine the economic feasibility and pre-engineering needs for producing ethanol from molasses. Brewer and HCPC will add another $200,000 to the project. Terms of the contract will be negotiated with the DOE. Earlier this year the companies' request for assistance from the Legislature for starting an ethanol producing plant was denied, but results of the study may cause the Legislature to reconsider its stand.

A discouraging situation at HCPC is that the low sugar prices of the past four years have forced many small growers in the cooperative out of business, and this is going to reduce production. The 1981 crop forecast is 100,000 tons of sugar, the smallest since the cooperative was formed in 1972. With a mill capacity of 120,000 tons, HCPC needs more sugarcane to run the factory at optimum efficiency. Many of the growers have accumulated debts over four years, and even the high prices prevailing this year may not be sufficient for them to recoup and stay in business.

Macadamia Nuts

The macadamia nut industry had a very good year in 1979 with record production of 26.7 million pounds, an increase of 27.1 percent over the 1978 crop. Total receipts to growers rose substantially to $16.8 million, compared with $11.3 million in 1978. This was an increase of 48.6 percent. One of the reasons for the good crop was sufficient rainfall, even in the normally dry South Kona and Ka'u districts. The average yield per acre was up by 500 pounds to 2,800 pounds, and the acreage in bearing trees increased by 400 acres during 1979 following a huge 2,900-acre gain in 1978. Sufficient moisture and the second-year crop on the new acreage helped raise the yield per acre last year. Rainfall continues to be better than normal, and further substantial gains in production are anticipated this year.

The Big Island continues to produce practically all of the state's macadamia nuts, with 1979 production of 26.6 million pounds amounting to 99.7 percent of total state production. The price received by growers averaged 62 cents a pound last year, bringing growers $16.7 million. The price was the highest ever received, and comes after a substantial 13-cent increase in 1978 to 53.8 cents a pound.

Mauna Loa Macadamia Nut Co., the world's leading producer, completed the first 1,000 acres of its planned 5,000-acre expansion last year. The second 1,000-acre increment is going in this year. Of last year's new acreage, 325 acres were planted in Waihee, Maui, and the remainder in Ka'u. This year it will be 500 acres each for Waihee and Ka'u. Maui will end up with about 1,200 acres of the 5,000 acres of new plantings. The company has added a food technologist to its staff who will work with consultants on the Mainland to develop new products. Mauna Loa introduced a new product—butter glazed macadamia nuts—last fall for test marketing in Hawaii. It has met a good response locally and soon the decision will be made whether or not to expand marketing to the Mainland. The company's objective is to introduce one new product annually and it plans also to process other products, such as cashew and pistachio nuts, under the Mauna Loa label. With an expanding nut crop and new consumer products, the company has been adding more workers. During last year's peak season there were

650 seasonal employes on the payroll.

The second largest producer of macadamia nuts in the state is Mac Farms of Hawaii in Honomalino, South Kona. It has bought out all of the individual farms there except two, and formed a 3,350-acre macadamia nut plantation. This includes 600 acres of abandoned orchards of which half was reclaimed this year; the other half will be brought back into production next year. A lot of work has gone into the orchards—cultivating, fertilizing, and pruning—which combined with good rains is beginning to produce good crops. Last year's production was 3 million pounds in shell, and the company is forecasting a 4-million-pound crop this year. Because of the difficulty of getting labor, the company has invested $65,000 for a harvesting machine that was made in California. Now it has four more on order. Mac Farms estimates that machine harvesting will reduce the unit cost of harvesting to 25 percent of the cost of hand harvesting.

Mac Farms is investing $1.6 million for a processing plant in Honomalino. The husking plant is completed, and the cracking plant is expected to be in operation later this year. The boiler and dehydration tanks are under construction and will also be ready in late fall. The factory will produce raw, dry kernels that will be packed in 25-pound bags for shipment. The nuts are being sold to several manufacturers throughout the state. Mac Farms doesn't have any plans so far for manufacturing consumer products.

Water is a problem for Mac Farms, which suffered from the drought several years ago. The State is drilling a well at a lower elevation in Honomalino, but until more water is available Mac Farms doesn't plan to expand its nut acreage.

Flowers and Nursery Products

Hawaii County is the largest producer of flowers and nursery products in the state. Receipts totaled $9.8 million in 1979, or 47.1 percent of the state total. This was also a 13.4 percent increase over 1978 sales of $8.6 million.

Anthuriums made up more than half of the Big Island's flowers and nursery product sales again last year. Total sales at wholesale amounted to $5.4 million, 96.5 percent of the total state sales of this flower, and an increase of 11.9 percent over 1978 sales, the first time that sales have passed the $5 million mark. Big Island growers sold 2.1 million dozens of anthuriums last year of which 1.7 million dozens or 84 percent of the total were exported to the Mainland and foreign countries. Exports to foreign countries reached 1.3 million dozens, up from 1.1 million dozens shipped in 1978. But Mainland shipments were down from 430,400 dozens in 1978 to 413,700 dozens last year. Italy, West Germany, Switzerland, and Japan have been the major foreign customers. Foreign shipments continued to grow substantially this year, but slowed in the second quarter. However, July foreign sales bounced back, and for January through July 1980 sales were up 19 percent above last year's. Foreign shipments have been increasing very rapidly since 1975, averaging better than 40 percent annual growth. While the European market softened in the second quarter, the Mainland market perked up, and Mainland sales were running 11.8 percent above last year's for the first seven months. Growers have made plans in the past for promoting anthuriums in various parts of the Mainland, but postponed them when the European market began to take off in 1976. Now may be the time to revive the plans. With rising air freight rates, the shorter distance to the Mainland would help to keep costs down.

The production area on the Big Island has increased substantially over the past two years. Plantings under artificial shade structures went from 9.1 million square feet in 1978 to 11.2 million square feet in 1979, while natural shade plantings declined from 4.7 million square feet in 1978 to 4.1 million square feet last year. Further expansion is expected as the State has opened up agricultural lots in Puna and the Panaewa farm lot subdivision.

The fastest growing sector of the industry is potted foliage as demand has been very strong on the Mainland and will continue to be for the foreseeable future. Competition from South American and Caribbean countries is not considered significant—their plants are cheaper but of poorer quality, and because of the communications problem buyers would rather do business with Hawaii. Receipts from this product were $540,000 in 1975. Annual gains have been substantial ever since, and last year receipts passed $4 million. Kohala Nursery and Amfac Nursery have been the large factors in this business, but a number of other farms are adding to the export volume. An example of these operations is the Kadota nursery in the Panaewa farm lots, one of six nurseries in this area. It has about 30 acres, and recently subleased 15 more acres. Production—mainly varieties of dracaena for export—increased 25 percent last year, and the nursery is expecting to double production eventually with the newly acquired lease. The energy economics of raising foliage plants in Hawaii are excellent, but shipping is a problem, which could perhaps be solved by small nurserymen getting together for combined surface shipments and setting up a distribution center on the West Coast.

Orchids have also become a big crop on the Big Island. Contributing to this surge is Orchids Pacifica, one of the more successful enterprises funded by the Kohala Task Force. Right now it is exporting 400 dozen dendrobium sprays a week to the Mainland but can't fill the demand. Its white dendrobium is in great demand, less so for the lavender. It also ships potted orchid plants in bulk to the Mainland. Good varieties developed in-house, and the warm days and cool nights of Kohala are helping this firm produce quality plants and flowers ten months of the year. It has three acres under shade, and is planning to expand the artificially shaded area next year. The operation is in the black, and a very profitable business is foreseen the years ahead.

Papaya

Severe storms early in 1979 destroyed many acres of papaya fields in Puna on the Big Island and other papaya-growing areas of the state. Destruction plus disease from excess moisture caused a drop of 33.3 percent in production of fresh-grade fruit in 1979. The small supply sent prices soaring, and growers realized a substantial gain in revenues for the year despite the small production.

Papaya that doesn't meet the standard for marketing as fresh fruit is processed into puree if not discarded or sold to hog raisers as feed. The low production last year and higher proportion marketed as fresh fruit left a smaller than usual volume of fruit to be processed, creating a shortage of papaya puree. This has sent the price of puree higher, too.

The heavy damage to trees saw a substantial reduction in average yields. Yield per acre for the state as a whole dropped from 29,200 pounds in 1978 to 18,600 pounds in 1979. Yields will not begin to improve until next year because high winds did more damage to fields in January of this year. Yet fresh market sales are expected to rebound to between 45 and 50 million pounds this year as grade and size regulations were suspended for the year beginning March 17, 1980 to meet the strong demand for fresh papaya. This will mean a continued short supply of papaya puree.

The Big Island's Puna District, where most of the state's papayas are grown, suffered the most severe damage of any of the state's production areas in 1979's early rainstorms, resulting in the lowest annual production in six years. Puna growers shipped only 27.1 million pounds of fruit in 1979, the lowest export figure since 1973. This was a decline of 35.9 percent from 1978 shipments of 41.7 million pounds.

However, the short supply boosted prices, and the average wholesale price received by Puna growers in 1979 was 24.2 cents a pound compared to 13.6 cents in 1978. Gross receipts for the year totaled $6.7 million, up over $900,000 from 1978 despite a 35 percent smaller crop. The volume of papaya processed was 3.4 million pounds, an increase of 55.9 percent from 1978 and a new record. Receipts were around $115,000 compared to $73,000 in 1978. The Big Island is once again the largest processor of papaya puree. Most of the puree was manufactured on Maui for the four years up to 1979, but Maui production is down to a fraction of what it was with the closing down of Princess Orchards last year. Puna Papaya Co. purchased the processing equipment from Princess Orchards and installed its processing unit next to the packing plant in Keaau last year. Operations started in August, 1979. The plant has a five-million-pound capacity which is larger than Puna Papaya's production can supply at present yields. There are two other papaya processors in Hilo, but even with the output of all three plants the supply of puree is insufficient to meet current demand.

Transportation continues to be a problem for the papaya industry, as it is for shippers of all other agricultural commodities on the Neighbor Islands. United Airlines is the only airline still serving the Hilo gateway, but after September 30 it will discontinue temporarily the Hilo-San Francisco route, leaving the daily flights of the Hilo-Los Angeles route the only direct air cargo capacity available to Puna growers. A large volume is being transshipped through Honolulu to the Mainland, but this added cost must either lower the return to growers or raise the price to consumers. Puna Papaya Co., the largest grower in the state, has developed a method of shipping papaya in containers via Matson roll-on, roll-off ships which works well. Just when Puna growers have succeeded in marketing larger volumes of fruit in Japan, increasing air freight rates may scare off potential consumers in that country. The air freight rate for papayas between Honolulu and Tokyo was 29 cents a pound at the end of 1979. On June 22 it was increased to 51 cents a pound, and the industry is bracing for two more increases by the end of the year.

Despite the rising costs of production and a cloudy transportation picture, acreage in papaya was increased modestly in 1979.

Hawaii County Statistics

	unit	period	1975	1976	1977	1978	1979	7 mo.* 1980	% change 7 mo.* 1980/1979
Population, Resident	number	July 1	75,300	77,800	79,200	81,800	83,700	92,206**	**
Per Capita Personal Income	dollars	total	5,687	5,758	6,162	6,687	n.a.	n.a.	—
Civilian Labor Force	number	mo. avg.	34,600	35,800	36,500	35,900	35,250	35,300p	0.1
Employment	number	mo. avg.	31,150	31,750	33,100	32,300	32,400	33,050p	2.6
Unemployment	number	mo. avg.	3,450	4,100	3,350	3,600	2,850	2,250p	−25.0
Unemployment Rate	percent	mo. avg.	9.9	11.4	9.2	10.1	8.1	6.4p	−24.7
Total Job Count[1]	number	mo. avg.	32,350	33,000	34,100	35,400	36,350	36,650p	2.8
Tax Collections	thous. $	total	49,487	53,550	54,709	63,231	72,577	44,225	10.1
Total Bank Deposits	thous. $	end per.	190,394	215,688	235,232	262,759	306,791	327,215	15.1
Debits to Demand Deposits	mil. $	total	1,485.8	1,556.5	1,754.3	2,009.5	2,495.7	1,676.4	20.2
Private Permits									
Residential	thous. $	total	38,698	29,243	39,505	60,963	91,942	57,244	19.8
Single Family	no. of units	total	826	821	1,070	1,382	1,429	755	−11.9
Multi-Family	no. of units	total	511	129	133	334	734	403	4.9
Non-Residential	thous. $	total	11,018	10,505	11,850	13,408	20,547	28,932	139.3
Public Contracts Awarded	thous. $	total	41,576	38,656	26,884	26,263	46,965	13,732	−24.1
Federal	thous. $	total	61	560	7,806	4,156	2,152	134	168.0
State	thous. $	total	31,505	18,022	13,370	16,551	39,818	11,137	−31.2
County	thous. $	total	10,009	20,074	5,708	5,556	4,994	2,462	33.1
Estimated Westbound Visitors	thous.	total	769.8	816.5	839.0	909.0	860.9	473.6p	−9.6
Intended Length of Stay—Westbound	no. of days	mo. avg.	3.08	3.05	3.13	3.25	3.40	3.49	3.3
Hotel Inventory	number	June	5,386	5,936	6,051	6,064	6,056	6,260	3.4
Hotel Occupancy	percent	mo. avg.	59.9	57.6	61.0	65.0	62.0	55.3	−14.3
Telephones in Service	number	end per.	50,090	52,746	55,941	58,661	62,322	65,044	6.7
Motor Vehicle Registration	number	total	53,001	56,845	60,317	62,937	67,584	n.a.	—
Sugar Production, raw sugar 96°	thous. tons	total	412	388	374	387	388	137	−8.9
Diversified Agriculture[2]	mil. $	total	35.7	41.5	44.1	54.6	65.1	n.a.	—
Crops	mil. $	total	20.3	25.8	28.9	34.7	43.9	n.a.	—
Livestock[2]	mil. $	total	15.5	15.7	15.2	19.9	21.2	n.a.	—

p = preliminary

n.a. = not available

**except hotel inventory (June).*

***The 1980 census count is not consistent with the 1970 postcensal estimates of population and 1970-80 intercensal revisions have not yet been made.*

[1]Refers to number of jobs rather than number of persons employed. Persons with more than one job are counted more than once.

[2]Includes estimates for milk and chickens.

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KAUAI COUNTY IN 1980

A Report by the Research Division *October, 1980*

Kauai County is experiencing relatively little economic distress in this year of national recession. Unemployment is at the lowest rate in a decade, and the economy is enjoying another year of overall gain. With statewide tourism in a recession, Kauai's visitor industry has suffered its worst decline in more than a decade this year, but the other major sectors of the economy are flourishing, and total employment has never been higher.

The island's economic stability is a result of a decade of steady expansion. The County decided early in the last decade to widen the base of its economy with two major objectives in mind: jobs for a growing population and a larger tax base that would provide for the anticipated growth in demand for public services. The twin objectives have been met commendably by the County administrations, but sometimes at the expense of preserving the island's natural beauty as development accelerated. The County government is beginning to bring this problem under control. During the last decade, population grew by more than 9,000 to 39,117 at the last census. The labor force grew by 4,200 and employment by 3,900. The average unemployment rate for the first eight months of 1980 was 4.5 percent, the lowest in ten years.

Construction, no doubt, is the strongest sector of the economy this year. The sugar industry and diversified agriculture have made further gains over the past year, and manufacturing and retailing continue to grow. Federal military and civilian programs on Kauai have been maintained at prior-year levels. The decline in occupancy has not affected the resort hotels as much as the growing pool of condominium rental units, but other services on the premises such as food and retail shops have suffered in the current weakness.

The boom in construction started in 1978 when the demand for second homes and investment units that sparked the Maui real estate frenzy spilled over to Kauai and the Big Island. The value of residential building permits peaked at $100 million in 1979, double the 1978 volume and equal to the volume of the four years from 1975 to 1978. Construction employment in the first eight months of 1980 reached a monthly average of 1,450, more than double that for the same period in 1979. This year the value of private building permits issued in the first eight months dropped 23 percent to $62.6 million from last year's $81.3 million and public contracts awarded dropped 63 percent to $4.5 million from $12.3 million last year, as high money costs took their toll. Although total permits and public contracts are down substantially from last year, they are much higher than in the second highest year of 1978.

This accelerated pace of construction has brought protests from groups afraid of the damage to Kauai's natural beauty and environment. The County has begun to address this problem, and further action will be forthcoming. Last July the County Council passed an ordinance which set up an environmental impact assessment schedule. Resort and multi-family developments will be charged a fee of $1,000 per unit, single-family subdivisions will be charged $250 or $500 a lot depending on the number of lots, commercial projects will be assessed $100 per parking stall, and industrial projects must pay 25 cents per square foot of gross building area. The money collected goes into a trust fund, then the County Council will decide how the funds will be used to benefit the island.

In another action the County started to control land development because of a water shortage. Since there is no water to service new projects being planned in the Koloa-Poipu area, the Board of Water Supply has declared a moratorium on construction there. The developer of the 224-unit Keoniloa Bay Villas, the first project affected, will be allowed to proceed only if he drills a well at his own expense with a minimum capacity of a million gallons a day. If not, he would have to wait until the County develops another well, which probably would take longer. A water shortage has also developed in the Wailua-Kapaa district, and the Board has indicated it will approve no larger than 15-unit projects up to a total of 200 units until more water is available.

The strong construction picture has been aided by the County's housing projects for the elderly and low-income and gap-group families, and for rental subsidized housing. The County is also working with Kekaha Sugar Co. on a large housing program. Kekaha Sugar Co. is going to build 138 single-family residences for sale in fee to employees, and another 89 existing homes will be sold to employees. The County will be involved with the plantation in the construction of 115 subsidized rental units, of which the Hawaii Housing Authority will develop 79, and Mark Watase the remainder. The rental units will be completed within 18 months, and the single-family residences will take about two years.

The largest commercial project on the island, which is about to get under way, is Grove Farm's shopping center, which will have a gross leasable area of 300,000 square feet. It will be built on 35 acres of former sugarcane land in conjunction with an adjoining 18-acre development that will include restaurants, an office complex, and retail outlets not well suited for a shopping center, such as a furniture store. The center has attracted such major retailers as Sears, Liberty House, Longs, and Star Super Market. Grove Farm will also build a sewage treatment plant to service this huge project. The target for completion of the center is spring of 1982, and the development cost is projected at $22 million.

Grove Farm has also received State Land Use Commission approval for the reclassification of 86 acres of land from agriculture to urban. Five acres of this total will be added to its light industrial park, 3.5 acres will be used for a 35-unit multi-family residential project, and most of the rest is slated for single-family housing to be developed over a period of years.

The Pacific Missile Range at Barking Sands has become an important base for the testing of the U.S. Navy's weapons sys-

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tems and for naval warfare training. Despite the Defense Department's efforts to reduce costs, the base has maintained its programs, and even added new facilities, a testimony to its importance. However, with better equipment, the command has been able to do the increased amount of work with less personnel. Modernization plans have been postponed until funds become available to carry them out. At least prospects for future funding look better with consensus in Washington this year of the need for shoring up U.S. defenses if Soviet challenges around the world are to be met. The command has 16 officers and 116 enlisted personnel, and 55 civil service employes. Dynalectron Corp., which has the maintenance contract, has approximately 400 employes. The NASA satellite tracking station at Kokee, manned under contract by Bendix Field Engineering Corp., is getting ready for the Space Shuttle program that may begin next spring. The shuttle is to launch the space-tracking satellite, known as the Tracking and Data Relay Satellite (TDRS). The Kokee station has 115 employes.

ALTERNATE ENERGY DEVELOPMENT

A few years ago there was little thought about making Kauai energy self-sufficient in the foreseeable future. In the few years since then, the situation has changed dramatically, and in 1981 Kauai will have the capacity to generate more than half of its electric power requirements from nonfossil fuel sources. This entire capacity, however, will not be in use immediately for lack of sufficient biomass fuel.

The biggest event in Kauai's recent history of alternate energy development occurred a few weeks ago when Lihue Plantation Co.'s new power generating plant went on line to supplement the distribution system of the Kauai Electric Division of Citizens Utilities Co. The start of this service immediately raised Kauai Electric's power from nonfossil fuel sources to 35 percent of the total. Before that, alternate energy made up approximately 12 percent of Kauai Electric's total annual sales.

Lihue Plantation Co. is contracted to supply, and Kauai Electric is obligated to buy, 55.6 million kilowatt hours of power annually during the 37-week sugarcane harvesting season for the next 20 years. The plantation's annual harvest will provide 250,000 tons of bagasse which will be sufficient to produce the contracted volume of power during the season. If there is a shortage of bagasse, the plantation will have to burn oil to provide the power or acquire more biomass fuel. The new plant actually has the capacity to generate 96.7 million kilowatt hours of power for export to Kauai Electric. It needs more biomass fuel to do this, and the plantation is looking into sources such as wood chips, county refuse, cane trash, and other material.

Getting the additional capacity into production is of benefit to all concerned. Revenues from the 55.6 million kilowatts sold go to Foster Wheeler Corp., which owns the new generating plant. Lihue Plantation provides the fuel and operates the plant in return for the steam and power it gets from the plant for its own needs. But net revenues after expenses over the contracted volume will be divided equally between Foster Wheeler and Lihue Plantation, so there is strong incentive for the plantation to develop the fuel sources needed to operate at full capacity. For Kauai Electric, there is an advantage, too, although it is not legally obligated to buy that power. The price it will have to pay for the extra power probably will be lower than for the contracted amount, while the diesel oil it burns in its generating units gets costlier all the time. The EPA requires that low sulfur oil be burned which rules out residual oil. The only low sulfur oil available is diesel oil. In 1976 both residual and diesel oil were priced the same. Today diesel costs $37.28 a barrel, and residual $22.95 a barrel, as demand for residual is down while demand for diesel keeps rising. Kauai Electric may not save much in the beginning of this new power supply contract, but over the 20-year life of the agreement it will reduce its fuel oil purchases substantially and in turn pump money into the American economy rather than paying OPEC.

The fuel economics for Lihue Plantation Co. are somewhat better than for Kauai Electric, and may improve further. Unlike Kauai Electric, Lihue Plantation is allowed to burn a certain amount of residual oil because the average sulfur level for total fuel burned is reduced to acceptable levels by bagasse, which contains no sulfur. The plantation can also install dry scrubbers which remove sulfur from the emission, although that equipment is very expensive. However, as the price for high-demand diesel oil escalates and the cost of residual oil remains low, it will become economically feasible to make the investment and use the cheaper fuel. Lihue's old generating plant that was replaced by the new one will not be dismantled completely. Half of the old plant is more than 50 years old and will go, but the other half is only 22 years old, and will be mothballed for possible reactivation if and when economics permit.

While Lihue Plantation is by far the largest supplier of power to the island utility, the other plantations have the potential of increasing their power-generating capacity depending on economics. Right now, the other suppliers are receiving very low rates because the power supplied is not dependable. The incentive to upgrade their plants and add additional capacity will be higher rates. Olokele Sugar Co. has a new agreement with Kauai Electric to supply 6 million kilowatt hours of interruptible power annually beginning in 1981. The plantation is installing a new 1,250-kilowatt run-of-river hydroelectric turbine generator, which will replace the old 500-kilowatt unit. Olokele Sugar is also having a study prepared by Thermal Engineering Corp. on how to increase the efficiency of the steam generating unit at its factory. Improvement of this factory unit could increase its power export by another 6 million kilowatt hours annually.

McBryde Sugar Co. is in negotiations with Kauai Electric for renewal of its power supply contract. McBryde has the potential of almost doubling its power export, and will do so if it can get a fair price for that power. McBryde's two hydroelectric units at Wainiha have a capacity of 2.7 megawatts, and the one at Kalaheo has a one-megawatt capacity. Its factory at Koloa has two turbo generators with 7.5 megawatts of capacity each. The hydroelectric units are producing pretty much up to capacity, but the potential for increase is at the factory. By using all of its bagasse and cane trash, McBryde could increase exports from the present 12 million kilowatt hours a year to 20 million kilowatt hours. Or it has the option of using that excess power to pump more water and irrigate the unirrigated fields to increase sugar yield, or even perhaps for other industrial uses.

Kekaha Sugar Co. has two hydroelectric plants in Waimea Valley which it plans to upgrade in order to increase power output. The one-megawatt unit is now 70 percent efficient, and the 500-kilowatt unit, only 40 percent. Refurbishing them to raise efficiency to rated capacity will be costly, and Kekaha will go ahead if it can negotiate a better rate for the power to be sold. The generating unit at the factory has a capacity of 6.5 megawatts, and it could be improved to increase power production. Expanding the cultivated area and improved cultural practices will raise sugarcane yield which means more fiber for use as fuel. Cane trash is another fuel source for an improved power plant. However, plans for this capital project are a few years in the future.

At Wilcox Medical Center, a photovoltaic system is going to be installed by Acurex Corp. of Mountain View, California, which has the federal contract for the project. The system will not only produce power directly from the sun but also hot water in the cooling of the heated collectors. A wind energy system for the hospital is in the early planning stage.

In other activities, Kauai Electric has been discussing wind energy development with Windfarms Hawaii; the County is

studying the feasibility of developing other biomass fuel such as municipal refuse, wood chips from koa haole, and cane trash; and the State is studying the hydroelectric generating potential of several sites. Kauai County recently adopted an energy self-sufficiency plan which stresses conservation through changes in the building code and planning regulations, and through reduction and more efficient use of energy in County facilities.

TOURISM

Kauai's visitor industry withstood the disruptions caused by the two-month airline strike and the grounding of the DC-10s last year rather well, but wilted in the last quarter as travel declined generally around the state and across the nation. The result was a 1.5 percent decline in visitor arrivals for 1979 to 825,366, the first drop since the Hawaii Visitors Bureau began compiling arrivals by counties in 1962. The fourth quarter weakness has carried over into 1980 with further deterioration. Arrivals for the first seven months were down 4.4 percent to 474,862, and the occupancy rate for the island has continued to slip, reaching a low of 63 percent in June. Part of the reason for this decline is that 371 new hotel units have been added since last year, bringing the Kauai inventory to 4,435. The occupancy rate for the first seven months averaged 71 percent compared with 79 percent for the same period last year. The resort hotels, however, are doing much better with occupancy substantially above the island average, while condominiums generally suffer the lowest occupancy. Visitor expenditures credited to Kauai County amounted to $159.2 million in 1979, compared with $138.0 million in 1978.

Despite the worst decline on record, Kauai's visitor plant is expanding rapidly with one new hotel under construction, a major addition being made to another, and two other hotels soon to get under way. Island Holidays' new hotel, The Waiohai, is now under construction at Poipu, with completion slated next year in time for a summer opening. The four-story W-shaped structure is being built on 11.5 acres of beachfront land, and will have 459 rooms. In addition, there will be three restaurants, six tennis courts, three swimming pools, a physical fitness center, and meeting facilities which will include a ballroom on the first floor with an auditorium capacity of a thousand people. Adjoining this new hotel will be the 141-room Poipu Beach Hotel which will be operated as a separate property by Island Holidays.

Nearby, the Sheraton Kauai Hotel is building a 232-room wing that will bring the room count to 402 when completed in December 1981. The administrative office and front desk will be relocated to the new building which will also include a convention center.

At Princeville, Consolidated Oil and Gas Corp. is ready to begin work on its 300-room hotel which Marriott Hotels will manage as part of its chain. Site work may begin before the end of the year and construction of the hotel will follow early next year. Another 18-hole golf course will be built at the same time. The hotel, overlooking Hanalei Bay, will have four dining areas, shops, and a convention center with a banquet hall.

Plans for the hotel at Nukolii have been in a state of uncertainty. A citizens group, the Save Nukolii Committee, has been attempting to stop the project. It has taken several legal actions to delay the start until the November election when it hopes voters will approve a referendum stopping the project. The developer feels work already done on the site and the $500,000 paid to the County as the environmental impact assessment gives it a vested right to proceed irrespective of the outcome of the referendum. If it should pass, the issue will have to be decided in court. Meanwhile, the site is being cleared for a condominium project.

At Coconut Plantation, Kauai's newest hotel, the Holiday Inn, is faring well with an 80 percent occupancy in only its second full year. Plans for the construction of another hotel there, to be operated by the Pacific Holidays chain, have been delayed further.

Convention and incentive tours have lifted tourism on Kauai the past few years above what it otherwise would have been. The Kauai Surf Hotel has been the main beneficiary because it has the only convention center on the island; in the future there will be convention facilities at Poipu and Princeville as well.

Poipu will become the largest convention center for the island. Facilities now being built by The Waiohai and Sheraton Kauai will be able to host relatively large conventions. Added to that will be Moana Corp.'s championship golf course, its commercial center, and condominium developments, plus the many condominium projects at Poipu Kai being developed by ADM International. These developments will provide the meeting places, lodging, and recreational and beach facilities to attract conventions and incentive tours. Poipu has the advantage also of having good climate and excellent beaches.

Princeville will have meeting facilities only in the Marriott Hotel, but there will be additional lodging and restaurants in the resort community. When the proposed golf course is built, Princeville will have two 18-hole courses and a nine-hole course that can be used interchangeably with the original 18. There are a couple of beaches, and in addition, boating and horseback riding will be available. There also is a shopping center, and this resort center is served by its own airline, Princeville Airways, from Honolulu and Lihue.

AGRICULTURE

Agricultural revenues at the farm level registered a substantial gain in Kauai County in 1979, paced by a large increase in the value of sugarcane harvested and substantial gains in papaya, banana, and seed corn crops. Total revenues reached $56 million, a gain of 20 percent over 1978 farm receipts of $47 million. For diversified agriculture alone, excluding sugar, receipts amounted to $8.6 million, a gain of 16 percent over 1978 revenues of $7.4 million.

Sugarcane harvested was valued at $47.7 million, third highest on record, and a gain of $8.1 million or 20.5 percent over the value of the 1978 harvest. Receipts for fruit more than doubled to $1.8 million, accounted for by the near doubling of papaya receipts of $1.5 million and a 36 percent increase in banana revenues which totaled $95,000. A sharp gain in yield per acre and a higher average price helped banana growers get better income on the same acreage. Field crops, consisting almost entirely of seed corn, registered an increase of 42.7 percent to $935,000. Production of vegetables and melons dropped 10.3 percent to 2.1 million pounds, but farm receipts rose 9.6 percent to $722,000 due to higher prices. Likewise, taro production declined 12 percent to 4.3 million pounds as the number of farms decreased, but higher prices raised receipts by 4.2 percent over 1978 to $641,000.

Sugar

The years of drought and low prices have finally turned around for the sugar industry. Kauai plantations have had better rains the past year but barely adequate supplies at times for optimum irrigation. Shortage of water in the early growing period will affect the yield of some of the fields harvested this year. However, sugar prices rose substantially early in the year and have remained at high levels since, which will assure the plantations substantial profits for the first time in six years.

Kauai's five plantations harvested a thousand more acres in 1979 than in 1978, but cane yield was lower and overall production results were below forecasts. Yields dropped slightly to an

average 10 tons per acre but production overall increased 4.2 percent to 232,400 tons. The average prices for raw sugar and molasses rose substantially last year and total revenues increased by 22.1 percent to $75.6 million. Sugar accounted for $70.6 million, a 20.7 percent increase, as the average price rose to $303 a ton from $262 a ton the previous year. Molasses prices rose faster from $50.70 a ton in 1978 to $72.50 a ton in 1979, and receipts reached $5 million, up from $3.4 million the year before. Revenues for 1980 will be much higher.

Having experienced a decade of dry weather and lack of adequate water for irrigation, all of the plantations are converting most of their fields to drip irrigation, not only to stretch water further and use it more efficiently, but to increase sugar and fiber yields. Kekaha Sugar Co., with some of the highest-yielding cultivated sugar lands in the world, is a classic example. Located on the dry, leeward side of the island with lots of sunshine, it could be the most productive sugar producer in the world given sufficent water. The decade of the 1970s was a dry period with annual summer droughts, and sugar yields suffered at Kekaha and most other plantations in the state. Kekaha began to convert its plateau (mauka) fields to drip irrigation a few years ago, and by the end of this year all 3,500 acres will be in drip. Normally, water is less available in these higher elevation areas than on the plain, and drip irrigation distributes water not only more evenly but also more efficiently. The result has been dramatic. Mauka fields harvested this year have yielded an average three tons of sugar more per acre. Adequate water efficiently applied, and a new high-yield variety of sugarcane developed at the HSPA Experiment Station that is highly smut-disease-resistant have made the difference. One field this year produced 19.85 tons of sugar per acre. The previous record at Kekaha was 18.5 tons an acre in a field in the normally more productive lower plain area. The average yield for Hawaii's sugar industry is 10 to 11 tons of sugar per acre. Kekaha will convert all but around 2,000 acres of its 8,000 acres to drip. Furrow irrigation will be continued on the other 2,000 acres to make use of the water discharged from the factory. Kekaha's crop this year is estimated at 49,000 tons with a yield of 13 tons of sugar per acre, an improvement over the past few years. Further improvement is forecast for 1981, with production expected to rise to around 52,000 tons.

Olokele Sugar Co. will have one of its poorer crops this year. Bad weather and lack of water in 1978 when the current crop was in its early growth cycle have had their effect on yield. Olokele has converted all of its fields to drip except for the small area irrigated by mill water, but lack of sufficient water has affected its normally productive fields. The company is developing more power sources and plans to drill two wells so that it will have a sufficient water supply even in dry years. The 1980 crop is estimated at 28,750 tons, and the 1981 forecast is for more than 31,000 tons.

McBryde Sugar Co. is expected to have a larger crop this year over last year thanks mainly to drip irrigation. Fields irrigated by the drip method have averaged 12.46 tons of sugar per acre this year, compared with 9.67 tons for fields irrigated by furrows, and 7.0 tons for unirrigated fields. Conversion of irrigated fields to drip will be completed in 1982. Beyond that, the plan is to convert some of the unirrigated fields to drip in the Omao and Koloa areas. The crop this year is estimated at 58,500 tons, and production next year is forecast to hit 60,000 tons.

Lihue Plantation Co. is going to have a smaller crop this year due mainly to a changeover to new cane varieties and loss of land. The 1980 crop is expected to be around 74,000 tons, and the 1981 crop will be slightly lower, as a smaller acreage will be harvested. Lihue is going to lose 600 acres to the Lihue Airport expansion, but there is no timetable as to when all of the land will be taken away. It has replaced 135 acres by reclaiming former pineapple lands in upper Wailua. It is going to intensify its farming practices to make up part of the loss by converting many of its fields including some unirrigated fields to drip so that eventually 60 percent will be drip irrigated. More frequent irrigation is also planned.

Aquaculture

Kauai lost its largest prawn producer this year when C. Brewer & Co. closed down its 100-acre pond farm at Kilauea, but immediately gained another when Amfac Inc. announced that it will enter into large-scale prawn production at Kekaha. This leaves Prawns of Hawaii as the only commercial operation right now on the island.

Although Brewer had production problems, its neighbor Prawns of Hawaii has fared much better. Its smaller size has made a difference as a small corporate business is able to keep costs lower, and the State supplies post-larval stocks without charge to small farms under a cooperative agreement. Owned and operated by Mr. and Mrs. Allan Rietow, the farm has 22.5 acres in producing ponds in addition to two experimental ponds. Over the past year the ponds have matured and production has increased. Their ponds are stocked twice a year now, but they would like to stock them more frequently. They are also planning to expand the farm by another 10 acres of ponds when financing is available. Marketing has been successful because the prawns are packed properly to arrive in fresh condition. They are sold almost entirely to restaurants and hotels on Kauai, Maui, and Hawaii. A weekly shipment also goes to Los Angeles. The operation has turned a profit in the fiscal year just ended.

The newest prawn farm was just started by Amfac Aquatech-Hawaii, a division of Kekaha Sugar Co., and headed by Rick Gibson. Ground was broken last month near Mana for a pilot project on 42 acres. The ponds are designed for mechanical feeding and harvesting. Two types of culture will be tested—a continuous operation where the young are stocked continually and the adults harvested (the method generally used now by other growers) and the grow-out method where one batch is grown to maturity and the entire pond harvested. The pilot project will concentrate on ways of reducing feed costs and on industrialization to reduce labor costs, two cost areas that must be controlled if a successful commercial operation is to be created. Cane trash is going to be tested as a feed to take advantage of the possibility of using a cane by-product. It does have a high carbon content, basic to all living matter, but the chemistry of the fiber will require its being broken down in some way first for it to be practical as a prawn feed. Labor efficiency is going to be very important to the ultimate success of this large scale business. Even with the mechanization now planned, the operation will still be much more labor-intensive than the sugar industry. Research will have to continue to reduce the labor input if the operation is to be viable. The ponds will use brackish water that the plantation normally pumps out to sea because it is too salty for irrigation.

Construction of the office will begin next month on the site, followed by the construction of the processing plant, which will be on line in April 1981. The plant will be of modular design so that capacity can be increased when needed. It will also be highly mechanized. When fully commercial, the plant will be able to process up to 5,000 pounds of prawns a day with a two-shift operation. Amfac Aquatech wants to have all the answers by spring of 1982 and be able to decide whether the operation will be expanded into a commercial one. If that decision is reached, the ponds will be expanded to include a total of 350 acres of water surface.

Marketing will be a challenge for the new enterprise. Prawns today are treated like produce, with a short shelf life. Amfac Aquatech wants to extend the shelf life of prawns and take them out of the produce category. Toward this end, it has developed

a better process of freezing that will extend the shelf life for a much longer period. The company credits the State and County governments for their excellent support—the reason for the project being on schedule. Given one of the best sites in the state for this kind of operation, and partially integrated into the plantation operation, the new firm is encouraged about its prospect for success.

Guava

Kauai's production of guava will take a giant step forward this year with C. Brewer & Co.'s Kilauea Agronomics forecasting a harvest of a million pounds by year end. Last year its early fruiting trees produced 250,000 pounds of fruit. The orchard, started four years ago, now covers 300 acres at Kilauea. About half of that will be bearing this year, and most of the remaining acreage will begin producing next year. The company is clearing land and filling its deactivated prawn ponds to expand the guava orchard by another 150 acres.

The State forecasts a four-fold increase in guava production over the next three years, and a good proportion of that increase will come from Kilauea. Its trees are just beginning to bear, and yield will be increasing for the next ten years. Total production of guava from cultivated orchards last year came to 4.5 million pounds for the state, with another 2 million pounds of wild fruit delivered to processors.

Kilauea Agronomics is planning to build a processing plant within the next 18 months, and in the meantime Hawaiian Fruit Preserving Co. in Kalaheo is handling the processing. Hawaiian Fruit has been handling up to 70,000 pounds of guava a week from Kilauea, and is able to do this because it just completed expanding its freezer capacity from 150,000 pounds to 500,000 pounds. In addition, it has doubled its production capacity, and will triple it soon. Most of the guava puree is being shipped to the Mainland and to Japan. Hawaiian Fruit processes guava three days a week, and manufactures jam and jellies the other three days. It receives 250,000 pounds of guava annually from pickers and small farmers for its own products. The company has also installed new equipment to process papaya with a capacity of 6,000 pounds of fruit an hour. It will get its papaya from the Moloaa cooperative and small farmers.

Brewer is providing a dependable supply of guava puree with its increased production. With the prospect of a substantial increase in production, it has been looking into marketing the ever-growing supply. It has been working with the University of Hawaii and the State on alternate processes of handling the puree other than freezing. Aseptical packing of puree is being studied. Freezing would not be required and there would be a great savings in freight charges with the product shipped as dry cargo. There is little or no change in the color or flavor of the puree with this kind of packing; however, not all problems have yet been solved.

Papaya

Papaya production on Kauai is not back on the growth trend of three years ago, but growers are in better shape than in the other three counties. Destructive storms the past two winters followed by moisture-caused diseases have chopped production in all growing areas. Kauai, however, has recovered faster and was the only county with an increase in production in 1979. Total production was 5.7 million pounds, up 7.8 percent from 1978. Of this total, 5.4 million pounds were sold as fresh fruit and the remainder was processed. Although the production increase was nominal, total revenue nearly doubled to around $1.5 million from $791.000 in 1978. The big shortage of fruit raised the average price for the year to 25.6 cents a pound compared with 14.4 cents in 1978.

Production this year is running slightly below the 1979 rate, with output for the first six months at 2.4 million pounds, 7.2 percent under the comparative 1979 production. Prices, however, were slightly higher than last year's substantially increased prices, and likely will remain high as statewide production again this year falls short of the record 1978 crop, although much higher than last year's crop.

The bulk of Kauai's production (approximately 85 percent) is accounted for by the Moloaa Papaya Cooperative. The fruit is packed and marketed for the co-op by Best Fruits Inc. Production by co-op members was slightly under 5 million pounds last year due to the loss of a million pounds of fruit in the windstorm early in the year. But higher prices increased receipts to growers by a good margin. Forecasts called for a substantial increase in production this year, but again a storm early in the year brought destruction to plants, and only a 5-million-pound crop is expected for the year. However, prices have been very firm all summer because the quality of competing deciduous fruit on the Mainland has been below standard due to a wet winter. About 90 percent of production by the co-op is of the Sunrise pink-fleshed variety which is in strong demand. Not only is the fruit firm and very sweet, but the shelf life is longer and the fruit grows more evenly on the tree so that the cull rate has been a low 10 percent. Most of the fruit is distributed on the Mainland by the Blue Anchor organization. The fruit is shipped to Honolulu by air, held overnight in cold storage, then flown to the Mainland to reach there at 6 a.m. the following morning for distribution to the markets that Blue Anchor has developed.

The Moloaa Cooperative has two new member growers in Kilauea, and will add three new growers in Moloaa where the co-op has 588 acres under lease, 225 of which are in papaya this year. The new growers will add 60 acres to the cultivated area next year, with production to begin in 1982. The co-op sees a substantially larger crop in 1981 if the winter storms are not as destructive as they have been the past two years.

Kauai County Statistics

	unit	period	1975	1976	1977	1978	1979	8 mo.* 1980	% change 8 mo.* 1980/1979
Population, Resident	number	July 1	32,700	34,000	34,400	35,500	36,400	39,117 **	**
Per Capita Personal Income	dollars	total	5,509	5,762	6,401	7,044	n.a.	n.a.	—
Civilian Labor Force	number	mo. avg.	16,300	17,150	17,900	17,600	17,500	17,900p	2.3
Employment	number	mo. avg.	14,800	15,550	16,700	16,400	16,550	17,050p	3.6
Unemployment	number	mo. avg.	1,500	1,600	1,150	1,200	1,000	800p	−20.0
Unemployment Rate	percent	mo. avg.	9.1	9.4	6.5	6.9	5.6	4.5p	−23.7
Total Job Count[1]	number	mo. avg.	14,550	15,250	16,100	16,650	17,350	17,850p	3.5
Tax Collections	thous. $	total	19,113	20,903	22,375	25,858	29,952	25,459	16.1
Total Bank Deposits	thous. $	end per.	93,533	93,114	105,475	116,889	130,465	143,704	9.6
Debits to Demand Deposits	mil. $	total	553.8	577.7	633.7	775.2	955.1	748.1	19.8
Private Residential Permits	thous. $	total	20,009	13,346	21,197	49,005	100,024	44,441	−37.3
Single Family Units	number	total	343	321	445	555	512	246	−37.1
Multi-Family Units	number	total	202	4	83	623	1,169	401	−47.2
Private Non-Residential Permits	thous. $	total	16,086	3,755	6,822	7,711	13,896	18,169	73.5
Public Contracts Awarded	thous. $	total	31,579	14,310	11,364	10,156	13,537	4,524	−63.3
Federal	thous. $	total	407	2,571	428	3,349	440	247	42.0
State	thous. $	total	25,865	7,684	5,628	2,627	8,619	1,821	−77.1
County	thous. $	total	5,308	4,054	5,308	4,180	4,477	2,456	−41.5
Estimated Westbound Visitors	thous.	total	632.8	699.3	740.5	837.7	825.4	549.5p	−5.1
Intended Length of Stay—Westbound	no. of days	mo. avg.	2.85	2.85	2.97	3.08	3.29	3.42p	4.9
Hotel Inventory	number	June	3,145	3,724	3,868	4,097	4,064	4,435	9.1
Hotel Occupancy	percent	mo. avg.	77.2	76.8	80.6	83.3	76.5	71.6	−9.4
Electricity sales	mil. KWH	total	163.0	170.0	183.2	201.0	204.2	138.2	2.3
Telephones in Service	number	end per.	20,851	22,073	23,576	25,692	27,411	28,806	7.5
Motor Vehicle Registration	number	total	23,901	25,366	26,912	28,080	29,825	n.a.	—
Sugar Production, raw sugar 96°	thous. tons	total	240	217	232	223	232	153	−9.7
Diversified Agriculture[2]	mil. $	total	4.1	4.0	5.1	7.4	8.5	n.a.	—
Crops	mil. $	total	2.4	2.3	2.9	3.1	4.2	n.a.	—
Livestock[2]	mil. $	total	1.7	1.7	2.2	4.3	4.3	n.a.	—

p = preliminary

n.a. = not available

**except hotel inventory (June).*

***The 1980 census count is not consistent with the 1970 postcensal estimates of population and 1970-80 intercensal revisions have not yet been made.*

[1]*Refers to number of jobs rather than number of persons employed. Persons with more than one job are counted more than once.*

[2]*Includes estimates for milk, chickens and eggs.*

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MAUI COUNTY IN 1980

A Report by the Research Division *December, 1980*

In 1980 growth of the economy of Maui County has slowed down appreciably following a decade of very rapid development. The slower growth is the result of a decline in tourism, and in turn a cutback in construction geared to the needs of the visitor industry. A significant indicator of the slowdown in 1980 is the County's tax collections, which for the first eight months have increased only 10.9 percent over the corresponding period of 1979, compared with an average annual gain of 15.1 percent in the four years between 1975 and 1979. However, sugar, pineapple, and diversified agriculture are doing well this year, as are several other sectors, especially manufacturing and the service industry. Jobs and employment are at record levels, and the rate of unemployment for the first nine months of the year was only 5.2 percent, the lowest rate in more than a decade.

The 1970s was truly the Maui decade, with the county's economic growth—led by tourism—far surpassing that of the other counties. Growth was so rapid in the past several years that the County Administration made a deliberate effort to slow it down with building moratoriums from Lahaina to Kula. The number of visitors more than tripled between 1970 and 1979, when more than 1.4 million visited the tri-isle county. Private residential building permits issued in those ten years amounted to $625 million, far above that for Hawaii or Kauai counties, mainly because Maui built a lot of condominiums in the decade to accommodate visitors. The number of multi-family units approved for construction by Maui County in the decade was 11,728, 35 percent more than the totals for Hawaii and Kauai counties combined. All of this buildup in the visitor industry resulted in a sixfold increase in visitor expenditures in Maui County during the decade, from $54.5 million in 1970 to $340.9 million in 1979. Growth in the other major sectors of the economy was not as dramatic, but grow they did. Diversified agriculture more than tripled its revenues, from $7.2 million to $22.1 million. The value of sugarcane harvested, without the value added from processing, doubled from $26.6 million to $52.2 million. The value of pineapple harvested, also without the value added from processing, doubled from $25.7 million to $50.1 million during the decade. Such a massive growth in the economic base gave rise to the stunning increase in tax collections. Even with a real property tax rate considerably below the other counties throughout the latter 1970s, dropping to about half the rate of the other counties in mid-1979, Maui County's tax collections more than quadrupled from 1970 through 1979, a much faster increase than for any of the other counties. Accompanying this rapid economic growth was a sharp gain in population. The 1970 census showed Maui County with 46,156 residents. Ten years later the count was 71,337, an increase of 55 percent over the decade, the fastest growth of any of the counties.

Mayor Hannibal Tavares, who took office late last year after more than a dozen years of stewardship by former Mayor Elmer Cravalho, is definitely leading the county into a new era of deliberate growth with emphasis on maintaining a wholesome environment and preserving the island life-style. Agriculture will continue to be favored. There will continue to be economic growth, but nowhere near the velocity of the past decade. Water will be the major limiting factor, as it has been for resort development in the last few years. The Mayor has asked developers for high-quality construction—mainly good design, open space, adequate setbacks, and heavy landscaping. Maui is an attractive place, and the Administration says it will pick and choose investors who will keep it so.

Maui's future development will be guided by its General Plan, which was adopted by the County Council this year. At the same time the Council provided for the preparation of nine community plans by the planning director. These plans will carry out the intent of the General Plan. They will detail such things as desired population densities in each community of both visitors and residents, land uses, environmental concerns, proposed highways, identification of sites having archaeological significance, etc. The nine districts are Lahaina, Kihei-Makena, Hana, Wailuku-Kahului, Makawao-Pukalani-Kula, Paia-Haiku, Molokai, Lanai, and Kahoolawe.

Water is a major concern of the present administration because it, more than anything else, would affect Maui's economic growth. Although most of the easily accessible surface resources have been developed, Maui has sufficient underground resources. It is costly, however, to develop underground resources. So Maui County a few years ago got large private users to help pay for new wells and transmission lines. A consortium of four large users has agreed to develop 19 million gallons a day of new supply in the West Maui mountains to supply the Central Valley down to Kihei. So far this group has completed wells that are providing 8.5 million gallons of water a day, and it has also paid for a large transmission line that stretches down to Makena. The County is assessing developers of large structures in the Central Valley area $2,700 a unit for water development. In West Maui the construction moratorium in effect for a few years due to a water shortage was lifted recently. But the County will assess developers of large projects a fee of $3,400 per unit. The fees will be used to develop new sources of water. The fee is higher than for Central Valley developers because West Maui sources are farther away and therefore the water is more costly to deliver.

The surface water flows of East Maui are uneven so that water is much more abundant in winter, and a lot of it is lost. Mayor Tavares is taking a close look at the possibility of storing the heavy winter runoff—up to 2 billion gallons—if a site can be found to build a reservoir. Such a supply would be ample to supply agricultural needs in Kula and Omaopio and domestic requirements during the drier summer season.

The county economy in 1980 is feeling the impact of the decline in tourism. For the first nine months, 1,062,500 visited the county, down 30,650 or 2.8 percent from the same period

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last year. This likely will be the first year in 20 years that Maui County will see an actual decline in visitor arrivals. The same reasons that are causing the drop in visitors are affecting real estate sales, which in turn is slowing down construction. The numbers for private building permits, however, appear contradictory with $104.5 million in construction authorizations in the first six months of this year, 54 percent more than in the corresponding six months last year. But not all of the permits are being translated into construction starts. A slower market for condominium units has resulted in a lag in construction at all the island's resort areas. Difficulty in getting affordable financing has also resulted in stalled projects. A longtime Maui contractor was the low bidder on two projects, but the developers encountered financing difficulties. This contracting firm couldn't handle all of the work available in the fall of 1979, but this year work has suddenly disappeared, and the firm has been forced to lay off most of its work force. Other contractors are also seeing their backlog of work diminishing. Many projects may be delayed until next year when the market may improve and easier financing may be available.

In addition, many projects are being planned, and construction will continue to be a major activity in the county. C. Brewer & Co. will begin to develop its huge Wailuku Heights subdivision next year. Kapalua has plans for the redevelopment of its old plantation village in order to increase its resident population, a base that is needed for this resort community. Amfac Properties has completed developing the south portion of Kaanapali, but it still has the North Beach area that can be developed after the airstrip is relocated. It is already planning the Hawaiian Sea Village, a cultural center. In addition, Amfac has two hotel sites and a major condominium site along the beach there. At Wailea, a 229-unit project to be called Alanui Village will be developed by Alanui Associates, a partnership that bought the project from Wailea Development Co. Work will begin next year with the first increment of 88 units. Wailea Development has a subdivision of 100 lots that will go on the market soon, and is planning a great number of single-family lots in the years just ahead.

The County government continues to develop housing for sale at lower than market cost to low- and middle-income residents and rent-subsidized housing for those who can't afford to buy. This has been made possible through the donation of land by large landowners. Alexander & Baldwin has donated 47 acres in Paia for a 275-lot subdivision and 10 acres in Kahului for 50 single-family lots and 122 apartment units. Amfac has donated 30 acres in Lahaina for townhouses and apartments to be sold to employees of Pioneer Mill and the Kaanapali resort, both owned by Amfac. Amfac has also built a 280-lot subdivision, which will be offered to ILWU members employed by the plantation and employees of the Hyatt Regency Maui and the Marriott Hotel. Maui Land and Pineapple Co. will donate 13 acres in Napili to the County for housing development. InterIsland Resorts broke ground October 30 for a two-story, 40-unit apartment building in Lahaina which will be rented furnished to employees of its Maui Surf Hotel. The structure will be made up of studio and one-bedroom units, and will cost more than $2 million. On Molokai, Kalua Koi Co. has donated 110 acres, which the County has exchanged with Molokai Ranch for a similar acreage at Maunaloa where new housing will be built for sale to residents. The County has a 38-unit subdivision under construction at Haiku, where the three-bedroom units will sell for an average $60,000. The County has also completed site work on 68 lots in Wailuku, half of which will be sold as lots and the remainder in house and lot combination.

The County is continuing its baitfish experiment at Kilauea Pond, and a 50-acre baitfish project will be built near the shore on West Molokai on land leased from Molokai Ranch.

Retail sales continue to increase this year, but at a much slower rate than in the past several years. Adjusted for inflation, sales are slightly below last year's volume. Reduced spending by visitors and fewer of them have contributed to the sales decline. The island's largest shopping centers—Maui Mall, Kaahumanu Center, and the Kahului Shopping Center—all report that their sales increases this year are much smaller than last year.

Maui has reclaimed an industry that couldn't make a go of it in the 1960s. Maui Distillers, a partnership, has purchased the distillery built by Seagram to manufacture rum in the 1960s from Alexander & Baldwin, and is repairing and increasing the capacity of the plant. Production is expected to begin next spring with initial output of 150,000 gallons of alcohol per month. Hawaiian Commercial & Sugar Co. has contracted to supply 15,000 tons of molasses annually, and Maui Distillers has an option to increase its purchase. Cane neutral spirits will be made in different strengths—with that below 190 proof to be made into rum, and that above 190 proof to produce vodka, gin, and cordials. Rectifying—the cutting, adding of color, and bottling—will be done in the Honolulu plant of Hawaiian Distillers, now owned by Maui Distillers. Raw alcohol will also be shipped to the West Coast for processing and marketing. The original proposal to produce anhydrous alcohol to make gasohol has been postponed. The production process involves boosting the alcohol content to 200 proof at which point a hydrocarbon is added. The necessary equipment for boosting the proof content is rather costly, and so that investment may be made later.

TOURISM

Tourism in Maui County leveled off this year, as it did statewide. The market softened last year following the strike against United Airlines in the second quarter, with weakness reappearing in the fall as air fares rose substantially due to increased energy costs. Despite the decline in the number of visitors, the industry is holding up relatively well overall. The count of westbound visitors to the county last year rose to 1,419,800, a record but only 1.2 percent more than in 1978, the smallest gain since figures were first compiled in 1962. However, visitor expenditures for 1979 came to $340.9 million for the county, 20.5 percent above 1978 spending of $283 million. Visitor arrivals for 1980 show an actual decline for the county in the first nine months, with 1,062,500 having visited so far, down 2.8 percent from last year's 1,093,150 for the same period. On the other hand, the average length of stay has been improving so that total visitor days spent in the county so far are slightly better than last year. In 1979 the average intended length of stay was 4.03 days, passing four for the first time, and in the first nine months of this year has gained further to 4.1 days. The occupancy rate has been declining the past two years because of the rapid increase in accommodations. The hotel inventory increased by 974 units to 9,654 in 1979, and so far this year has gained further to 10,483 units. The occupancy rate slipped to 73 percent last year, and through September this year averaged 68.5 percent. Hotel employment so far this year is up 15 percent to a record 4,850, accounted for by the opening of the Hyatt Regency Maui in April.

In the past decade only Maui County has increased its share of the Hawaii visitor dollar, while Oahu has held even and the islands of Hawaii and Kauai have lost part of their shares. In 1970 Maui County's share of total visitor spending was 9.2

percent ($54.5 million) compared to Hawaii's 9 percent ($53.4 million) and Kauai's 7.6 percent ($45.1 million). In 1979 Maui's share had increased to 13 percent ($340.9 million), while Hawaii's dropped to 6.6 percent ($172.2 million), and Kauai's to 6.1 percent ($159.2 million).

The Hyatt Regency Maui at Kaanapali, the largest Neighbor Island hotel with 815 rooms, opened April 17, and has been around 80 percent filled since. A pre-sell campaign resulted in a well-occupied hotel from the beginning at a time when tourism is in a slump all over the state. A corporate incentive tour and convention for a large insurance company opened there the first week, and over a three-week period brought 3,500 guests. The hotel has booked 50 insurance companies for this type of tour over the next two and a half years, as well as other large companies. Incentive tours and conventions will be a major market for the Hyatt which has 25,000 square feet of meeting space. The ballroom has 17,000 square feet and can be divided into four separate rooms. It can accommodate 3,300 for receptions or 1,400 for banquets. In addition there is a fully equipped outdoor facility that can hold a thousand for a reception or seat 700 for a banquet. The hotel is also going after the individual (FIT) traveler and is aiming for a 50-50 mix of independent travelers and incentive-conventions.

The Hyatt Regency was built on 18.5 acres of beachfront property by Hemmeter Maui Development Co., the owner, and is managed by the Hyatt Hotels Corp. The hotel consists of three connected structures made up of the nine-story Kaanapali Tower and the seven-story Lahaina and Napili Towers on either side. There are four restaurants and two cocktail lounges on the premises. Five tennis courts are open to guests, and there is a one-acre free-form swimming pool, a health club, and a 52-foot catamaran which can be reserved by guests. The grounds are heavily landscaped and feature an Oriental garden and an atrium lobby with trees and numerous plants. An art collection valued at $2 million is displayed around the hotel, and both art and garden tours are offered guests. There are 19 shops, all operated by the Hemmeter firm. The hotel has 900 employes.

Under construction next to the Hyatt is another large hotel, the sixth for Kaanapali. The 720-room hotel is being built by Kaanapali Beach Partners, and will be managed by the Marriott Hotel Corp. This will be the first Marriott hotel in the state, and is scheduled to open late next year. It will have three restaurants, three lounges, five tennis courts, 12 shops, and a pool with a Jacuzzi. There will be a 14,000-square-foot ballroom which the hotel will be able to divide into ten different rooms for conventions and meetings.

Being planned to replace the 102-room Maui Palms Hotel in Kahului is a 350-room 12-story hotel on the 4.9-acre parcel. The land is zoned for business and the developer has asked the County to rezone it for hotel use with a 12-story height maximum. Hearings were being held by the Maui Planning Commission. A special management area permit is also required before construction can begin. The hotel, which will retain the original name, will have an 800-seat banquet hall for meetings and conventions.

A third hotel is being planned at the Wailea resort. It will be a 300-room luxury hotel, and will be built on the beach south of the Inter-Continental. The hotel will be managed by the Hilton Hotel Corp.

The Seibu resort south of Wailea is beginning to take shape with the completion of its championship golf course designed by Robert Trent Jones. Hawaiian Dredging and Construction Co. is building the clubhouse, an access road, and parking, and Arisumi Brothers is working on the maintenance building. The golf course will be opened next summer for play. Work on a hotel and condominium apartments cannot begin until an 8,500-foot water transmission line is laid from Wailea. The water line will be installed after the road alignment is completed as the line will run parallel to the roadway. Seibu was part of a consortium that developed the water sources in the West Maui mountains and built the transmission line all the way to Wailea.

The Maui Lu Hotel in Kihei is planning to expand its facilities by building six three-story structures with a total of 132 rooms. This will increase its size to 295 rooms. There will be no elevators, and the buildings will be connected by walkways. Heavy landscaping will be used to beautify the grounds. In addition, the hotel is going to build another structure that will contain a specialty restaurant and house its executive offices and the lobby and registration area. Last year the hotel completed a million-dollar renovation program with new carpets and color TV sets for all the rooms, and installed a new telephone system connecting all of the rooms. Occupancy dipped substantially this year, but the hotel management is hoping for an improved 1981. Marketing efforts have been intensified, and the Maui Lu is now part of the Best Western hotel and motel reservation system that includes 21,800 different properties.

ALTERNATE ENERGY DEVELOPMENT

Expansion of alternate energy development in Maui County has taken longer than in the other Neighbor Island counties, but this situation is changing as several projects are going through the planning stages and some are getting started. On Molokai there is the big thrust of the State/County effort to make the island self-sufficient in electric power in three years, while on the island of Maui the sugar plantations are making major strides in alternate energy development.

The Molokai project is the first priority of the Hawaii Energy Self-Sufficiency Program which was submitted to the Department of Energy in August by the State. The project will be undertaken by the State, County of Maui, Hawaii Natural Energy Institute, and a private consortium including Molokai Electric Co., Molokai Ranch, and Molokai Energy Co. Being sought is $6.3 million from the Department of Energy, with the County to provide $196,000 and the State $785,000. The private firms will put up $11.2 million, mainly by Molokai Electric Co., which will move its generating plant.

Molokai Electric Co. has outgrown its facilities at Kaunakakai, and there is no land area for expansion. Therefore, in conjunction with the energy self-sufficiency project, it is moving its generating plant to a new location in Palaau, a few miles west of Kaunakakai. This will be the first biomass-fueled generating plant in Hawaii outside those in the sugar industry which use sugarcane waste for fuel.

Serving a population of close to 6,000, Molokai Electric's present generating capacity is 8 megawatts with peak generating needs of 5 megawatts. Sales last year totaled 23 million kilowatt hours. The plan is to develop an alternate energy capacity of 10.5 megawatts by 1984 to make the island self-sufficient. That capacity will be reached by utilizing biomass, hydro, wind, and solar systems. Construction of the biomass boiler and generator will begin next May, with all of the fuel intended to be grown on the island. Right now hay will be the main fuel, to be supplied by Molokai Ranch, which will be able to supply 12,000 tons of 15 to 25 percent moisture hay a year in the beginning. Other potential fuels are chips from koa haole, forest thinnings, community refuse, and dried pineapple plant material when available. The boiler will also be able to burn coal,

and with a slight modification, oil. In the beginning, 60 percent of the biomass fuel would be made up of hay and burnable waste from homesteads. Molokai Ranch will increase its deliveries of hay in the years ahead. Meanwhile, the County is planning to start a tree farm to grow koa haole on the island. Experimental plantings four years ago in the County agricultural park in Hoolehua are now 30 feet tall. The first tree farm may be from 200 to 300 acres in size. The County is also planning a koa haole tree farm on Maui.

The Molokai hydroelectric project envisions the use of the water rushing down the pipeline into Kualapuu Reservoir to run a hydroelectric generating plant that would provide 90 kilowatts of power capacity. This would be firm power because the water flow is relatively constant. Another proposal calls for a pumped storage system in which an afterbay (storage pond) would be built below the reservoir, or the reservoir would be used as the afterbay with a storage area built above it at a higher elevation. A penstock would connect the two bodies of water for the generation of power, and the water would be pumped back to the upper holding area by wind energy. This system could develop 1.6 megawatts of generating capacity.

Molokai's first windmill was installed recently by Molokai Energy Co. on the plateau overlooking the sea near Ilio Point. Three other units are to be put up at Ilio Point with the aid of Department of Energy grants. The unit already installed is a small one, similar to the one being experimented with at Kahua Ranch on the Big Island. If a study to be made on Molokai shows steady winds of good velocity, the Department of Energy may approve the installation of a large experimental windmill on the island.

Molokai is competing for a solar thermal power project that the Department of Energy is offering a small American community that is isolated and has a high proportion of low-income residents. Of 47 communities that applied, Molokai is one of six finalists from which the winner will be chosen. This solar unit will use collectors which will concentrate the sun's rays to heat water to produce steam and generate electricity. Its generating capacity will be a maximum one megawatt.

However exciting the Molokai project might be, the major advance in alternate energy development in the county is taking place on the island of Maui. Hawaiian Commercial and Sugar Co. (HC&S) is increasing the electric power output at both its Puunene and Paia mills. Pioneer Mill Co. will start work on a feasibility study for solar energy technology to be combined with the biomass-fueled generating unit now in operation at its Lahaina factory.

HC&S has begun to install a new 15-megawatt turbogenerator at its Puunene factory to replace a 4-megawatt unit. With two 10-megawatt generating units already in place, the Puunene factory will have a generating capacity of 35 megawatts when the new generator goes on stream next spring. The new turbogenerator will account for a 25 to 30 percent increase in power output. At the Paia factory, the company is installing a bagasse dryer in order to reduce the moisture content from the present 46 percent down to the 35 to 40 percent range. Flue gas from the smokestack will be piped into the drum dryer for this process, and this action will substantially reduce air pollutants. So, in addition to drying the bagasse, this process will help the factory comply with clean air standards of the Environmental Protection Agency. The drier bagasse will burn hotter and increase the power generated by 6 percent. The actual gain will not be that great after subtracting the maintenance cost and energy required for the process, but the EPA requirements will be met.

HC&S is also installing a low-head hydroelectric generating unit with a 600-kilowatt capacity. This unit will be operated whenever there is a sufficient flow of water from the East Maui Irrigation Co. ditch. When completed HC&S will have 5.9 megawatts of hydropower capacity and 44 megawatts of biomass-power capacity.

The company has expanded the grinding capacity of the Puunene factory to handle the cane it grinds for Wailuku Sugar Co., which has closed down its mill, plus the increasing yields from its own fields. Expansion of grinding capacity is also planned for the Paia factory.

With power output on the increase, HC&S has signed a new agreement with Maui Electric Co. under which it will supply the utility with firm power during the grinding season, and interruptible power during the off-season. The amount of power sold will vary with the rainfall. During a dry year, the company is forced to pump a tremendous amount of water for irrigation, and in addition, the amount of hydro-generated power would be low, and the amount of power exported to Maui Electric would be low. It would be just the opposite during a wet year, as 1980 has proved to be. Last year HC&S sold 35 million kilowatt hours of power to Maui Electric. This year rainfall has been heavy, and through August HC&S had already sold 33 million kilowatt hours of power to Maui Electric. With the added generating capcity, HC&S could export way in excess of 50 million kilowatt hours in a good year.

The proposal to the Department of Energy to study the feasibility of a solar energy facility at Pioneer Mill Co. was made jointly by Amfac Inc., parent firm of the sugar plantation, and Bechtel National Inc. The latter will do the engineering work. The project calls for a field of collectors which would concentrate the sun's rays to produce steam which in turn would drive the turbine to generate power. This solar energy system would provide power to the factory during the day, and bagasse would be burned at night as required. Various aspects of cogeneration possibilities will be studied. The Department of Energy will determine after the study whether it would be economically feasible to grant the funds to build the system.

The plantations have been supplying about 7 percent of the annual volume of power sold by Maui Electric Co. The increased output at HC&S could raise the proportion of biomass and hydro-generated power sold by Maui Electric to more than 10 percent.

AGRICULTURE

Cash receipts for agricultural commodities received by growers in Maui County soared to $124.4 million in 1979. The $15.7 million or 14.5 percent gain over 1978 receipts was accounted for mainly by higher production and higher prices for sugarcane and pineapple, which grossed $52.2 million and $50.1 million respectively, at the farm level. Sugarcane brought $8.6 million more than in 1978, and pineapple receipts were $4.6 million ahead of 1978.

Although sugarcane and pineapple were the big gainers in 1979, receipts for diversified agriculture rose a substantial 13.1 percent to $22.1 million, exceeding the $20 million mark for the first time. The large gain was made possible mainly by substantially higher receipts for cattle. The amount of cattle sold by Maui and Molokai ranches in 1979 totaled 7.5 million pounds (dressed weight), 860,000 pounds or 12.9 percent more than in 1978. In addition, average prices received by ranchers were substantially higher than in 1978. The combination of greater production and higher prices produced a 41 percent increase in receipts to $7.1 million. Production of both feedlot and range-

fed cattle showed increases last year, and feedlot cattle made up almost two-thirds of the total sold. The cattle business has been good for the second year in a row for Maui ranches especially. Two years of good rains have resulted in plenty of grass for the animals. Keeping them longer on grass and finishing them off in feedlots in half the normal time has cut feed costs for those who are able to short feed their animals. In addition, the higher prices for cattle for two years now have given ranchers some of their best years in the past decade.

Other significant gains in diversified agriculture were recorded for flowers and nursery products which increased 17.5 percent to $2.9 million and for field crops—forage and seed corn—where receipts increased 21.2 percent to $1.5 million. Diversified crops as a whole had a poor year in 1979 because papaya was being phased out as a commercial crop and vegetable production declined appreciably due to storm losses. However, total receipts for diversified crops increased by 2.3 percent to $10.6 million. Receipts for vegetables amounted to $4.9 million, the same as in 1978, although production in 1979 was down by more than 2 million pounds. Sales of fruit other than pineapple suffered a loss of about a third to $1 million, as papaya production began to wind down, with the closing of commercial orchards on Maui.

Papaya sales for 1980 will be negligible, but three crops in Maui's future will begin to offset that loss. They are protea, wine grapes, and guava.

Protea growing, centered in Kula, is getting a shot in the arm with the revitalization of the growers cooperative. Split by internal dissension, the cooperative was down to five members by the end of 1979. The members hired Nancy Gillingham, who has a master's degree in business with an emphasis in marketing, as general manager in January. A drive increased membership to 20 growers. All prior debt has been repaid, and the cooperative is able to pay growers before it is paid, which has proven an incentive for growers to join the group. Demand has been good, and the cooperative is buying from nonmembers to fill orders. A promotional campaign is being planned by the cooperative and other growers, with funds from the State. Shipments in 1979 doubled to almost a million stems, but receipts were up only 25 percent to $264,000 as a result of softer prices. The cooperative is looking for a 10 to 15 percent increase in production this year, with bigger increases in the years just ahead as new acreage begins to produce.

Tedeschi Vineyards had its first crop of wine grapes this year, but it was a disappointingly small crop. The harsh winter storm in January and a relatively wet year made for poor producing conditions. The juice quality, however, was very good, and the winery went through its first crushing. The wine will not be ready for the market until 1984. The 1981 crop should be around 22 tons or more depending on weather, and the harvests should increase for several years after that. The yield is expected to be around 1.5 tons per acre in the third year and increase gradually after that depending on weather and cultural practices.

Meanwhile, sales of its Maui Blanc, made from pineapple, have increased 30 percent so far this year, and two more fermenting tanks of 2,000 gallons each have been installed to double the fermenting capacity. The winery will produce around 8,000 cases of pineapple wine this year, and 200 cases of sparkling wine, also made from pineapple. The sparkling wine is a new product and production will be increased substantially next year. The company shipped pineapple wine to the Mainland last summer for the first time.

Orchards of Hawaii, which took over the fruit-processing operation of RJR Foods, is encouraging individual growers in East Maui to grow guavas and passion fruit, which it processes at its Kahului plant. The plant is expected to handle 700,000 pounds of guava this year, with increasing production over the next five years. The company has also distributed enough passion fruit vines to growers to cover 32 acres. Passion fruit production was 260,000 pounds in 1979, and increasing production is expected as new fields begin to bear.

Sugar

The 1980 sugar crop for Maui may possibly come in under 250,000 tons, somewhat below original forecasts. Heavy rains which delayed harvesting at one plantation and smut disease which reduced yield at another were the major causes for lower production this year. Production last year reached 252,816 tons, an improvement over the decade low of 245,342 tons in 1978.

Wet weather slowed harvesting at Hawaiian Commercial and Sugar Co. during the first half, and it will be forced to carry over about 1,800 acres into the 1981 crop. Production is estimated at around 176,000 tons this year, but the 1981 crop is expected to reach 200,000 tons, partly as a result of the carryover fields. The drip-irrigated fields that have been harvested this year were yielding an average 15.2 tons of sugar per acre through September, considerably better than yields for furrow-irrigated fields. By the end of this year, HC&S will have converted 18,000 acres to drip irrigation, and it is asking approval of its directors to fund the next phase which will take in the lowlands. The cane handling capacity of the Puunene and Paia factories was expanded last year with the addition of another mill unit each. A further expansion at the Paia factory is planned, and expansion of the boiling house capacity at the Puunene factory is now in progress. This expansion program will make it possible for HC&S to handle the sugarcane from Wailuku Sugar Co. and the increased yields from its own fields.

Pioneer Mill Co. has been plagued by water shortages over the last decade, but it had good rainfall this year. However, smut disease was found on its main cane variety, and yields have suffered. The popular cane variety, 50-7209, is being replaced this year with a newer smut-disease-resistant variety. HC&S is also replacing two varieties. Pioneer Mill has forecast a crop of 50,800 tons this year, and a drop to 46,600 tons next year. The lease on land owned by Maui Land and Pineapple Co. expired, and this acreage was put into pineapple by Maui Land to replace other pineapple acreage where the lease had expired and was not renewed. In all, Pioneer Mill expects to lose a little more than 600 acres by 1983, but it hopes to replace most of that by opening up new fields in the uplands back of Lahaina. Pioneer Mill is also experiencing a substantial gain in yields from its drip-irrigated fields, and conversion of its fields to drip will be completed by 1983. All but the fields irrigated with mill water and treated effluent from the County will be converted to drip.

Wailuku Sugar Co. had a crop surpassing 25,000 tons in 1979, but production will start declining this year with part of its cultivated area being converted to macadamia nut orchards. Of the 5,300 acres in sugarcane, 700 acres were planted in macadamia by the end of last year. By the end of this year, the orchards will have expanded to 1,100 acres. There will be 400-acre expansions in the next two years, leaving 3,300 acres in sugarcane by the end of 1982. The company is forecasting a crop of only 22,800 tons in 1981, but the per-acre yield will be higher at around 11.5 tons. Yield this year will be higher, too, and the company credits the growth in yield to drip irrigation and new cultural practices.

Pineapple

The 1979 pineapple harvest in Maui County totaled 491,000 tons, which made up about 72 percent of the state's production. This was a very slight increase over 1978 production. However, this year's crop may be lower than last year's as heavy rains during the year have reduced yields.

After having enjoyed several years of good sales and record profits, the pineapple industry is encountering more competition in the marketplace. The world production record was established in 1971-72 with a resultant oversupply of pineapple. World production then began to decline, reaching a low in 1975, and since then has increased annually. Production this year is expected to surpass the previous high and establish a new record. Foreign pineapple, mostly Thai, is making a stronger appearance in the U.S. market this year, due to a sluggish European market which is pushing more Thailand production onto the U.S. market. However, Hawaii's producers have very efficient operations, and are expected to have continued profitable years in the 1980s. The rising cost of energy is forcing the industry to find new ways to keep production costs down. Engineers at Maui Land and Pineapple Co., for example, developed labor-saving devices during the 1950s and 1960s when labor costs were increasing rapidly. In the 1980s they will be busy developing energy-efficient processes for the cannery and other plantation operations.

Maui County Statistics

	unit	period	1975	1976	1977	1978	1979	9 mo.* 1980	% change 9 mo.* 1980/1979
Population, Resident	number	July 1	55,000	58,200	60,300	63,100	65,500	71,191 **	**
Per Capita Personal Income	dollars	total	5,917	6,436	6,960	7,676	n.a.	n.a.	—
Civilian Labor Force	number	mo. avg.	27,800	29,400	26,300	31,750	32,400	33,600p	3.5
Employment	number	mo. avg.	25,050	26,300	28,700	29,350	30,350	31,850p	4.6
Unemployment	number	mo. avg.	2,750	3,100	2,300	2,400	2,050	1,750p	−14.6
Unemployment Rate	percent	mo. avg.	9.8	10.6	7.4	7.5	6.3	5.2p	−16.1
Total Job Count[1]	number	mo. avg.	25,400	26,600	28,450	30,950	32,700	34,550p	5.7
Tax Collections	thous. $	total	37,020	43,049	47,031	54,405	64,905	57,108	10.9
Total Bank Deposits	thous. $	end per.	150,009	171,409	197,315	238,641	263,974	272,837	8.0
Debits to Demand Deposits	mil. $	total	1,243.3	1,426.2	1,736.4	2,246.4	2,786.7	2,253.9	8.6
Private Permits	thous. $	total	116,852	74,795	74,768	168,923	146,444	110,242	47.5
Residential	thous. $	total	95,690	37,086	58,298	104,094	107,857	77,338	30.5
Single Family	no. of units	total	797	873	1,081	994	1,010	477	−22.6
Multi-Family	no. of units	total	2,208	229	497	1,330	1,098	809	19.5
Non-Residential	thous. $	total	21,163	37,710	16,469	64,829	38,587	32,904	112.5
Public Contracts Awarded	thous. $	total	23,075	35,296	26,863	43,564	36,777	14,260	−54.2
Federal	thous. $	total	1,848	4,599	10,833	2,134	1,572	3,388	5,950.0
State	thous. $	total	10,628	13,807	7,239	25,242	28,420	9,638	−60.4
County	thous. $	total	10,599	16,890	8,792	16,187	6,785	1,234	−81.6
Estimated Westbound Visitors	thous.	total	931.9	1,110.7	1,257.1	1,403.1	1,419.8	1,062.5p	−2.8
Intended Length of Stay—Westbound	no. of days	mo. avg.	3.42	3.50	3.62	3.77	4.03	4.08p	2.0
Hotel Inventory	number	June	6,018	7,378	8,397	8,680	9,654	10,483	8.6
Hotel Occupancy	percent	mo. avg.	72.3	74.8	76.9	80.4	73.0	68.5	−8.2
Electricity Sales	mil KWH	total	349	390	438	475	476	373	5.7
Telephones in Service	number	end per.	36,142	41,196	46,417	51,316	55,497	59,385	8.9
Motor Vehicle Registration	number	total	41,766	45,858	51,228	56,376	60,668	n.a.	—
Pineapple Production, fresh equivalent	thous. tons	total	499	457	454	488	491	n.a.	—
Sugar Production, raw sugar 96°	thous. tons	total	261	263	265	245	253	208	4.9
Diversified Agriculture[2]	mil. $	total	13.0	15.0	16.1	19.6	22.1	n.a.	—
Crops	mil. $	total	6.9	7.8	9.0	10.4	10.6	n.a.	—
Livestock[2]	mil. $	total	6.1	7.2	7.1	9.2	11.5	n.a.	—

p = preliminary
n.a. = not available

**except hotel inventory (June), and private permit data (7 mo.).*

***The 1980 census count is not consistent with the 1970 postcensal estimates of population and 1970-80 intercensal revisions have not yet been made.*

[1]Refers to number of jobs rather than number of persons employed. Persons with more than one job are counted more than once.

[2]Includes estimates for milk, chickens, and eggs.